

ABSTRACT OF THE DISCLOSURE

Disclosed herein are compositions and methods for increasing protein production from a cell culture. By switching the cells from a replicative to a productive state (RP switch), protein biosynthesis is extended. The productive state is a pseudo-senescent state. This pseudo-senescent state can be induced by transforming the cells with a vector expressing a cell cycle inhibitor. Expression of the cell cycle inhibitor within the cell, because it does not cause cell death, allows for cells to be maintained in culture for longer periods. The invention allows for controlled enhanced protein biosynthetic productivity of cell lines for commercial and research purposes.